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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/082,823

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Yoshiro Sato

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26161

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EXAMINER

DUDEK, JAMES A

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 03/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/082,823	SATO ET AL.	
	Examiner	Art Unit	
	James A. Dudek	2871	

-- *Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --*
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 11-17 is/are rejected.
- 7) ☒ Claim(s) 9 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's prior art figure 11 in view of Li et al. ("143").

For claim 1, figure 11 teaches wavelength selecting module for selecting a light signal having a specific wavelength from a plurality of light signals having different center wavelengths [filter 103], the plurality of light signals being provided as diverging light [see the paragraph bridging pages 1-2], the module comprising: a first collimator for collimating the diverging light to generate a collimated light beam [see 101 of figure 11]; and

Figure 11 lacks a liquid crystal cell having a predetermined helical direction, wherein the liquid crystal cell separates a light signal having a specific wavelength among the plurality of light signals of the collimated light beam into a left circularly polarized light and a right circularly polarized light, reflects one of the left and right circularly polarized light signals that has a same optical rotatory direction as the predetermined helical direction toward the first collimator in a first state, and passes the plurality of light signals of the collimated light beam in

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a second state, and wherein the liquid crystal cell changes between the first state and the second state in accordance with a change in physical energy applied thereto.

However, 143 teaches a liquid crystal cell having a predetermined helical direction, wherein the liquid crystal cell separates a light signal having a specific wavelength among the plurality of light signals of the collimated light beam into a left circularly polarized light and a right circularly polarized light, reflects one of the left and right circularly polarized light signals that has a same optical rotatory direction as the predetermined helical direction toward the first collimator in a first state, and passes the plurality of light signals of the collimated light beam in a second state, and wherein the liquid crystal cell changes between the first state and the second state in accordance with a change in physical energy applied thereto [see figure 5, column 6, paragraph 5, and column 5, lines 15-20]. 143 teaches using the cell in an optical system and is used for switching light. Furthermore 143 teaches using the cholesteric switch 10 for the benefit of switching light having a very wide bandwidth. Furthermore, using the cell of 143 with the prior art would have giving more control then the passive filter element of the prior art.

Accordingly, it would have been obvious to one of ordinary skill at the time the invention was made to combine the cell of 143 with the prior art figure 11.

Per claim 2, the wavelength selecting module according to claim 1, wherein the liquid crystal cell includes: a liquid crystal having a pair of surfaces; and a pair transparent electrodes which are provided on the pair of surfaces and to which a voltage as the physical energy is applied [see 24, 12, 14, 34].

Per claim 3, the wavelength selecting module according to claim 1, wherein the liquid crystal is one of a cholesteric liquid crystal and a chiral nematic liquid crystal [see column 3].

Per claim 4, the wavelength selecting module according to claim 1, wherein the collimator includes: a collimator lens for collimating the diverging light to generate the collimated light beam and converging an optically selected light signal having the specific wavelength reflected by the liquid crystal cell [see background of the invention, as the lens 105 would converge the reflected light]; first optical fiber for guiding the plurality of light signals to

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emit the diverging light to the collimator lens [104]; and second optical fiber for transmitting the optically selected light signal [106].

Per claim 5, the wavelength selecting module according to claim 1, further comprising a second collimator for receiving a transmission light beam which pass the liquid crystal cell and conversing the transmission light beam [107].

Per claim 6, the wavelength selecting module according to claim 5, wherein the second collimator includes: a collimator for converging the transmission light beam; and an optical fiber for transmitting the transmission light beam [the second lens would converge the light since the first lens collimates the light].

Per claim 7, the wavelength selecting module according to claim 1, wherein the first collimator includes a first collimator unit for causing the collimated light beam to obliquely enter the liquid crystal cell; and a second collimator unit for conversing an optically selected light signal having a specific wavelength reflected by the liquid crystal cell [105 and 107].

Per claim 8, the wavelength selecting module according to claim 5, further comprising a second collimator for conversing a transmission light beam obliquely emitted from the liquid crystal cell [106].

Per claim 11, figure 11 in view of 143 teaches wavelength selecting apparatus for selecting at least one light signal from a plurality of light signals having different center wavelengths the plurality of light signals being provided as diverging light, the apparatus comprising: plurality of wavelength selecting modules; and plurality of optical fibers for optically connecting the plurality of wavelength selecting modules, wherein each wavelength selecting module includes, a first collimator for collimating the diverging light to generate a collimated light beam, and a liquid crystal cell having a predetermined helical direction and receiving the plurality of light signals of the collimated light beam from the first collimator, wherein the liquid crystal cell separates a light signal having an associated wavelength among

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the plurality of light signals of the collimated light beam into a left circularly polarized light and a right circularly polarized light, reflects one of the left and right circularly polarized light signals that has a same optical rotatory direction as the predetermined helical direction toward the first collimator in a first state, passes the plurality of light signals of the collimated light beam in a second state, and wherein the liquid crystal cell changes between the first state and the second state in accordance with a change in physical energy applied thereto [see rejection of claim 1].

Figure 11 in view of 143 lacks a plurality of wavelength separators in the optical system. However, 143 teaches two states, narrow and wide broadband states. As such this is similar to combining two cells one being narrow and the other being broadband. Furthermore, it was known to separate. See Nerwin v. Elichman, 168 USPQ 177, 179 (PTO Bd. Of Int. 1968).

Per claim 12-13, see rejection above.

Per claim 14, figure 11 in view of 143 teaches a wavelength selecting apparatus for selecting at least one light signal from a plurality of light signals having different center wavelength, the plurality of light signals being provided as diverging light, the apparatus comprising: a first collimator for collimating the diverging light to generate a collimated light beam; and a liquid crystal cell unit for receiving the plurality of light signals of the collimated light beam from the first collimator and reflecting at least one light signal toward the first collimator, wherein the liquid crystal cell unit includes a plurality of stacked liquid crystal cells and wherein each liquid crystal cell includes, a liquid crystal which has a pair of surfaces and a predetermined helical direction, wherein the liquid crystal separates a light signal having an associated wavelength among the plurality of light signals of the collimated light beam into a left circularly polarized light and a right circularly polarized light, reflects one of the left and right circularly polarized light signals that has a same optical rotatory direction as the predetermined helical direction toward the first collimator in a first state, passes the plurality of light signals of the collimated light beam in a second state, and wherein the liquid crystal changes between the first state and the second state in accordance with a change of a voltage applied thereto, and 30 a pair of transparent electrodes which is provided on the pair of surfaces of the liquid crystal and to which the voltage is applied, wherein at least one liquid crystal enters the first state by

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individually changing voltages applied to the liquid crystals via the pairs of transparent electrodes [see rejection of claim 11 above].

Per claims 15-17, see rejections above.

Allowable Subject Matter


Claims 9-10 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Per claims 9-10, the wavelength selecting module according to claim 1, the prior art of record fails to teach a first wave plate, located between the liquid crystal cell and the first collimator, for converting the plurality of light signals of the collimated light beam to a plurality of circularly polarized light signals having a same optical rotatory direction as the predetermined helical direction of the liquid crystal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A. Dudek whose telephone number is 308-4782. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H. Kim can be reached on 703-305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7721 for regular communications and 703-308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


James A. Dudek
Primary Examiner
Art Unit 2871

March 20, 2003